

(19) World Intellectual Property  
Organization  
International Bureau



PCT

(43) International Publication Date  
4 November 2004 (04.11.2004)

(10) International Publication Number  
WO 2004/094319 A1

(51) International Patent Classification<sup>7</sup>: C02F 1/48

(74) Agents: ONSAGERS AS et al.; P.O.Box 6963 St. Olavs  
plass, N-0130 Oslo (NO).

(21) International Application Number:

PCT/NO2004/000116

(22) International Filing Date: 23 April 2004 (23.04.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
0309224.4 23 April 2003 (23.04.2003) GB

(71) Applicant (for all designated States except US): EMT RE-  
SEARCH ASA [NO/NO]; Kjølnes ring 56, N-3918 Pors-  
grunn (NO).

(72) Inventor; and

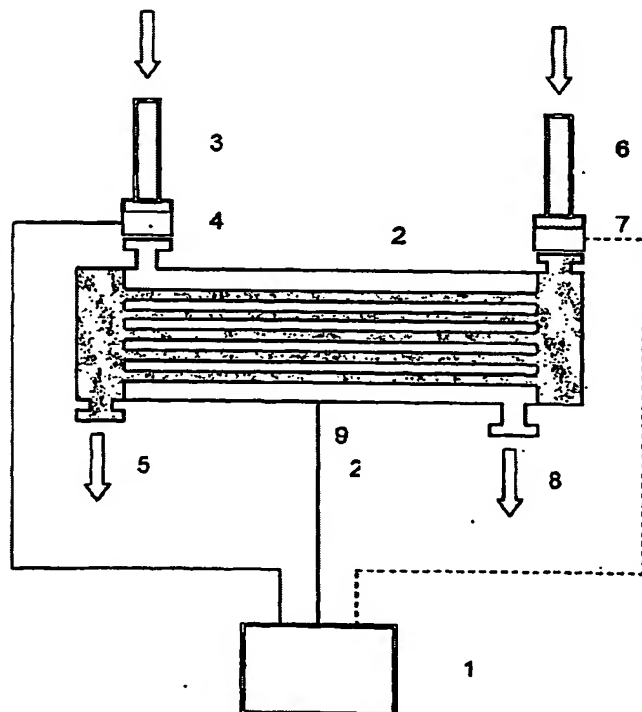
(75) Inventor/Applicant (for US only): WASKAAS, Magne  
[NO/NO]; Sagdalsringen 43, N-3748 Siljan (NO).

(81) Designated States (unless otherwise indicated, for every  
kind of national protection available): AE, AG, AL, AM,  
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,  
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,  
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,  
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,  
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,  
ZW.

(84) Designated States (unless otherwise indicated, for every  
kind of regional protection available): ARIPO (BW, GH,  
GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),  
Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), Euro-  
pean (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR,  
GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK,

[Continued on next page]

(54) Title: METHOD FOR FLOW IMPROVEMENT AND REDUCTION OF FOULING IN PROCESS EQUIPMENT



(57) Abstract: This invention relates to a  
method and apparatus for improvement of  
flow rates and reduction of fouling in process  
equipment such as for instance heat exchangers  
(2) where fluids are flowing in single or  
multiphase. This is obtained by imposing  
a DC-potential at the walls of the process  
equipment that exactly opposes the naturally  
occurring potential due to interaction between  
the walls of the process equipment and the  
fluid flowing inside. An improved flow rate  
will cause that the heat exchanger (2) becomes  
more efficient, i.e. a lower deposition rate and  
a higher removal rate of inorganic agents. The  
fluid may be a pure fluid, colloidal fluid or  
contain inclusions in the form of particles.